3G/HD/SD PORTABLE VIDEO SWITCHER
HVS-100/110
HANABI
The HVS-100 and the HVS-110, portable video switchers, boast exceptional cost performance. Both mixers inherit and improve upon the diverse functions and features of the popular HVS-300HS, including mixed HD/SD input, frame synchronizing, re-sizing engine, 2.5D wipe effects, DVE, Chroma keyer and DSK. The HVS-100 and HVS-110 also have a built-in Web server that lets you change settings from a PC or a tablet. A clip memory feature has been added to the still store to support playback of video or animations and enhances productions through the use of CG wipes, while the multi-viewer meets a diverse range of monitoring needs. The equipment can be used in all types of locations, including live events, sports, news studios, OB vans, editorial offices and presentation venues, making it the ideal tool for shaping the imaginative ideas of video creators.

Enhanced Multi-functionality and Unbelievable Cost Performance

Two models are available: one with separate main unit and control panel, and one with compact, integrated design, both of which can be adapted to a wide variety of applications and operation configurations.

HVS-100

The control panel has been laid out specifically with professionals in mind with a design that leverages the knowledge of expert operators. It includes dedicated bus buttons, AUX buttons, a fader controller and direct user buttons for various functions. The main unit offers exceptional expandability to facilitate the addition of a redundant power source unit and various input/output cards.

HVS-110

Featuring operability almost on par with the HVS-100, the HVS-110 also boasts a compact design enabling simple portability. The inclusion of ample video input and output functionality, making it ideal for use in small broadcasting vans and broadcasting helicopters. Despite being portable, a redundant power source is also possible using an optional AC adaptor.
HVS-100/110 Main Features

Standard 8, Maximum 14 Inputs;
Standard 4 + 1, Maximum 9 outputs (HVS-100)

8 HD/SD-SDI inputs, 4 HD/SD-SDI outputs and 1 HDMI output come as standard. Mixed HD/SD input is supported in the standard configuration. The 5 outputs can all be freely assigned. Three slots enable various inputs and outputs to be added, such as analog component, analog composite, HDMI, and VGA in addition to more HD/SD-SDI.

12 Inputs; 8 + 1 Outputs (HVS-110)

12 HD/SD-SDI inputs, 8 HD/SD-SDI outputs and 1 HDMI output come as standard. Mixed HD/SD input is supported in the standard configuration. The 9 outputs can all be freely assigned.

Input/Output Card Configuration

The following outlines combinations of input/output cards that can be used in the HVS-100 slots. Refer to “Options” for details of cards.
HVS-100/110 Main Features

Frame Synchronizer
Every input in the HVS-100 and 8 inputs in the HVS-110 are fitted with frame synchronizers that enable switching of synchronous and asynchronous video signals. Installation of optional expansion cards supports asynchronous picture input from PCs, etc. Each input is also equipped with a process amplifier capable of adjusting the video level and chroma level, etc. of the input signal.

Re-sizing Engine
Up-resizing engines are provided on 4 of the standard inputs. This achieves a fully mixed SD/HD environment with the switcher alone. The optional input cards also have re-sizing engine on each input. This is readily suitable for re-sizing not only SD signals but also PC video (*Up-resizing engines are not supported at 1080p).

Progressive-format, 4K Square Division (SQD) signal support
HVS-100/110 units already support Progressive Segmented Frame formats such as 1080/29.97PsF, 25PsF, 23.98PsF, 24PsF. Support for additional progressive formats, 1080/29.97p, 25p, 23.98p, 24p, has been added. HVS-100/110 is now able to use 4K camera Square Division (SQD) signals on 29.97p, 25p, 23.98p and 24p.

Level-B signal input support at 1080/59.94p, 50p
HVS-100/110 have a new Level-B/A converter function on input signals that allows Level B of 3G-SDI signals to be input onto 1080/59.94p, 50p signals. Level-A and Level-B signals are combined to system equipment on the input-side of the switcher, which converts Level-B signals to Level-A, and outputs all signals as Level-A. (Output-side fixed as Level-A.)

Audio playback support
Play back clips with audio. Sound effects can be mixed on switched videos using CG-Wipe effects. To utilize this function, download the audio data to the HVS-100/110 in advance.

2 Keyers and 2 DSKs
Further proof of the power of these new small mixers is that they come as standard with 2 keyers, 2 DSKs and 4 powerful 2.5D DVE engines.

Advance Chroma Key
An advanced, high quality Chroma keyer can be assigned to any one of the two M/E Keyers or two Downstream Keyers.

4 DVE 2.5D (rotation and perspective)
The 4* powerful DVE engines, can be assigned to any keyer or used for transitions etc, and with their standard 2.5D ability, allows flexible creativity for the operator to enhance productions (*Only 2 DVE engines are available at 1080p).

Abundant Transitions and DVEs
Cut, mix and wipe can be chosen for the transition. Diverse DVE wipes include 100 2.5D wipe patterns. Along with wipes, effects like mosaic and defocus are also provided.

2 Still/Clip Stores
Powerful, high capacity clip stores are now a standard feature. Each store can hold up to 227 frames of HD video. Images can be recorded and played back from incoming video or PGM o/p, or animations transferred over FTP (.bmp, .jpeg, .tga sequences). Clip store images can be used as CG wipe transitions, to further enhance possibilities and add production value. In addition, should both stores be used for clips, then still images can be used as well, by the standard feature of using some of the inputs as still stores.
20 kinds of multi-viewer split patterns able to be selected as standard.

Display channels can be freely assigned, allowing assignment of not only input source but also PGM output. Each channel offers title display and tally display functions.

External Interfaces

External interfaces include GPI port supporting up to 24 inputs/outputs and two RS-422 ports as standard. The RS-422 ports support for connecting an HVS-30RU remote unit, tally expansion boxes, device specific VDCP, VTR, MFR routers, or TSL. An Ethernet port is used during PC control. An editor interface option allow to connect to an editor/automation system or other external control system.

GUI Control Function via Web Browser

An in-built Web server enables the settings of the HVS-100 and HVS-110 to be changed from a PC via a network. Mobile and tablet terminals can also be used through a wireless access point.

VDCP Over IP protocol available

Support for VDCP Over IP protocol allows video server control via a LAN connection.

Redundant Power Supply

An optional redundant power supply unit enables doubling-up of power source (redundant AC adaptor for the HVS-110). An enlarged fan and improved exhaust process guarantee quiet operation.

External keyer control over DSK-400

HVS-100/110 are now able to control the DSK-400 (supports 4K (UHD)). A compact system can be built to operate a DSK-400 using only an HVS-100/110 controller.

4K (Ultra-HD) Switcher Capability

The HVS-100 and HVS-110 can be used as 4K switchers with HVS-100EXP3G. HVS-100 supports 2 inputs/1 output (expandable to 3 inputs/2 outputs with optional Input/Output cards). HVS-110 supports 3 inputs/2 outputs. In conjunction with MFR series, 4K input channels can be expanded. Cut and mix are provided as transitions.

Other

- Safety area marker display
- Color bar generator
- Mat generator, etc.

Additional Non-Border display function support and 4K mode layout on Multi Viewer

Selection of Non-Border Multi-Viewer function is now supported. In 4K mode, Square Division (SQD) signal able to assign each quarter window, and display the 1080p Re-sized output. In 16-part layout mode, maximum four 4K video images are able to be monitored simultaneously via display.

Macro Function

A macro function enables you to store and register a series of operations and then perform complicated operations with one push of a button.

Event Memory and User Button

The main unit is equipped with an event memory function allowing up to 100 events to be stored. Event memories can be simply recalled by the user buttons. Mixer set-ups and useful operational tools such as key set up, DVE position/size etc can all be stored in event memories. Operators can freely set the transition time and effect for loading events. By setting up in advance, event memories can bring extra power and creativity, simply by pressing buttons during the live event. User buttons can also be used for many other features, such as instant navigation to a selectable menu page, or grab a still, or send a GPI, or preview a key etc as well as many other functions to make life easier in a live production.

Freely Assignable DSK

The 2 Downstream keyers can be assigned to either the M/E PGM, M/E PST or an AUX output. As we also include the ability to mix on an Aux crosspoint selection, the Aux outputs can effectively and creatively be used to do away with the need for multiple M/Es, when creating different outputs for different screens or feeds at a live venue.
HVS-100DI-A
HD/SD-SDI Input Card
4 channels of HD/SD-SDI input are possible with a single card. A frame synchronizer function for all inputs and re-size (expansion) function for 2 inputs are provided. SD images can be processed internally as HD images.

HVS-100AI
Analog Video Input Card
2 channels of analog video signal input are possible with a single card. The user can select between analog composite and analog component (HD or SD) input for each input terminal.

HVS-100DO
HD/SD-SDI Output Card
2 channels of HD/SD-SDI output are possible with a single card. Down-converters are provided for all outputs, HD and SD images can simultaneously be output.

HVS-100AO
Analog Video Output Card
2 channels of analog video signal output are possible with a single card. Output terminal 2 is a dedicated connector (conversion connector supplied). The user can select between analog composite and analog component (HD or SD) output for each output terminal.

HVS-100PCI
PC (HDMI/VGA) Input Card
HDMI and VGA terminals have been mounted onto a single card. 2 input channels are possible using both.

HVS-100PCO
PC (HDMI/VGA) Output Card
HDMI and VGA terminals have been mounted onto a single card. 2 output channels are possible using both.

Options
Options for the HVS-100
With the HVS-100, you can add just the input and output formats you need, in just the amount needed. There are three expansion slots so that other inputs and outputs can be installed, such as analog component, analog composite, HDMI and RGB in addition to HD/SD-SDI.

Resolutions supported by the input cards
- **HD mode**

<table>
<thead>
<tr>
<th>SD mode</th>
<th>525/50i</th>
<th>625/50i</th>
</tr>
</thead>
<tbody>
<tr>
<td>525/50i</td>
<td>640 x 480i (VGA), 720 x 576i (EDTV, PAL)</td>
<td>640 x 480i (VGA), 720 x 576i (EDTV, PAL)</td>
</tr>
</tbody>
</table>

- **SD mode**

| 525/59.94p | 640 x 480i (VGA), 720 x 576i (EDTV, PAL) | 640 x 480i (VGA), 720 x 576i (EDTV, PAL) |

- **HD mode**

<table>
<thead>
<tr>
<th>1020/59.94p</th>
<th>1020 x 585i (EDTV), 1080 x 576i (EDTV)</th>
<th>1020 x 585i (EDTV), 1080 x 576i (EDTV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1020/50i</td>
<td>1020 x 585i (EDTV), 1080 x 576i (EDTV)</td>
<td>1020 x 585i (EDTV), 1080 x 576i (EDTV)</td>
</tr>
<tr>
<td>1020/24.97p</td>
<td>1020 x 585i (EDTV), 1080 x 576i (EDTV)</td>
<td>1020 x 585i (EDTV), 1080 x 576i (EDTV)</td>
</tr>
</tbody>
</table>

* HDCP-incompatible
** Video signal disturbances may occur in 25 or 50 system frame rate formats, when input images are played at a 60Hz refresh rate.
HVS-100TB2
Thunderbolt™ 2 Expansion Card
The Expansion Card has a Thunderbolt™2 I/O, high speed transfer standard. It has capability to transfer simultaneously up to 4 Full HD video, multiple audio, and control signals by just one cable. It is also available to transfer one 4K/UHD video for input or output. *require in the future

Options for the HVS-110

HVS-110PSM
Redundant Power Supply Unit
For the HVS-110

Options for the HVS-100/110

HVS-TALOC32
HVS-TALR32
Tally Interface Unit
Open collector-type HVS-TALOC32 or relay-type HVS-TALR32 can be connected. They are both half-rack size, and up to 3 units can be connected to the HVS-100 or HVS-110.
- HVS-TALOC32: open collector system with 32 terminals
- HVS-TALR32: relay system with 32 terminals

HVS-100EXP3G
3Gbps Expansion Software
Software to support 1080p format and 4K Square Division transmission methods.

HVS-100VR
Virtual Link Software
Software for establishing a link between FOR-A Virtual System and HVS-100/110 to build a compact virtual studio system comprised of multiple cameras and small number of CG/combine processors.

HVS-100ED
Editor Interface Software
Interface software to connect with an external device that supports BVS-3000/DVS and GVG-100 protocols.

HVS-100ARC
ARCNET Card
This enables connection to HVS-AUX8/AUX16.

HVS-100PSM/100PSO
Redundant Power Supply Unit
- HVS-100PSM: For the HVS-100
- HVS-100PSO: For the HVS-100OU Control Panel

HVS-AUX8
AUX Remote Control Panel
Half-rack sized AUX remote control panel with 8 buttons. 5 units can be daisy-chained via ARCNET. A panel extension kit enables the button interface to be extended.
- HVS-AUX8RK: Panel extension kit (for HVS-AUX8)

HVS-AUX16A/16C/32A/64A
AUX Remote Control Panel
AUX remote control panels with either 16, 32 or 64 buttons. The 16-button panel and the 32-button panel are 1U in size and the 64-button panel is 2U in size. 5 AUX remote control units can be daisy-chained via Ethernet.

HVS-AUX16B/16D
AUX Remote Control Panel
Desktop type of AUX remote control panels with 16 buttons.
### HVS-100/110 Specifications

<table>
<thead>
<tr>
<th></th>
<th>HVS-100</th>
<th>HVS-110</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Video Formats</strong></td>
<td>1080i/59.94i, 1080/50i, 1080/59.94p, 1080/25p, 1080/24p, 1080/25p/24p, 1080/23.98p, 1080/23.98PsF, 1080/25PsF, 1080/29.97PsF, 720/59.94p, 720/50p, 1080/59.94p and 1080/50p Level A (HVS-100/EXPG)</td>
<td>525/60 NTSC, 625/50 PAL</td>
</tr>
<tr>
<td><strong>Video Inputs</strong></td>
<td>HD-SDI: 1.5 Gbps or SD-SDI: 270 Mbps, 750i, BNC x 8 (FSs on 8 inputs, resize engines on 4 inputs)</td>
<td>HD-SDI: 1.5 Gbps or SD-SDI: 270 Mbps, 750i, BNC x 12 (FSs on 8 inputs, resize engines on 4 inputs)</td>
</tr>
<tr>
<td><strong>Video Inputs (optional)</strong></td>
<td>HVS-100A</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>HVS-100EXP3G</td>
<td>3G SDI Level A-Level B: 3 Gbps</td>
</tr>
<tr>
<td><strong>HVS-100AI</strong></td>
<td>HD analog component, SD analog component, analog composite</td>
<td>—</td>
</tr>
<tr>
<td><strong>HDS-100PCI</strong></td>
<td>HDMI XGA to WUXGA (1080i, 1080/59.94p, 59.94i, 25p, 25p, 24, 23.93p), XGA to SXGA (720p, VGA to SXGA) (SD)</td>
<td>—</td>
</tr>
<tr>
<td><strong>HDP-incompatible at all resolutions</strong></td>
<td>RGB: XGA to WUXGA (1080i, 1080/59.94p, 59.94i, XGA to SXGA (720p), VGA to SXGA (SD)</td>
<td>—</td>
</tr>
<tr>
<td><strong>Number of Video Inputs</strong></td>
<td>Standard: HD-SDI x 8 / Max.: Refer to “10 Expansion Card Configuration.”</td>
<td>Standard: HD-SDI x 12</td>
</tr>
<tr>
<td><strong>Video Outputs</strong></td>
<td>HD-SDI: 1.5 Gbps or SD-SDI: 270 Mbps, 750i, BNC x 4, HDMI x 1</td>
<td>HD-SDI: 1.5 Gbps or SD-SDI: 270 Mbps, 750i, BNC x 8, HDMI x 1</td>
</tr>
<tr>
<td><strong>Video Outputs (optional)</strong></td>
<td>HVS-100DO</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>HVS-100EXP3G</td>
<td>3G SDI-Level A: 3 Gbps</td>
</tr>
<tr>
<td><strong>HVS-100AI</strong></td>
<td>HD analog component, SD analog component, analog composite</td>
<td>—</td>
</tr>
<tr>
<td><strong>HDS-100PCI</strong></td>
<td>HDMI: SXGA to WUXGA/HDTV (1080i, 1080/59.94p, 59.94i, 25p, 25p, 24, 23.93p), SXGA to WXGA/HDTV (720p), SXGA/SDTV (SDI)</td>
<td>—</td>
</tr>
<tr>
<td><strong>HDP-incompatible at all resolutions</strong></td>
<td>RGB: SXGA to WUXGA/HDTV (1080i, 1080/59.94p, 59.94i, XGA to SXGA (720p), VGA to SXGA (SD)</td>
<td>—</td>
</tr>
<tr>
<td><strong>Number of Video Outputs</strong></td>
<td>Standard: HD-SDI x 4 / Max.: Refer to “10 Expansion Card Configuration.”</td>
<td>Standard: HD-SDI x 8, HDMI x 1</td>
</tr>
<tr>
<td><strong>Signal Processing</strong></td>
<td>3-2-1; 4-bit, digital component</td>
<td>—</td>
</tr>
<tr>
<td><strong>Quantitative</strong></td>
<td>HD/SD-SDI: 10 bit</td>
<td>—</td>
</tr>
<tr>
<td><strong>Effect</strong></td>
<td>Wipe: 100 patterns, border and softness / 2 SD DVE: 56 patterns or more DVE Wipes</td>
<td>—</td>
</tr>
<tr>
<td><strong>Transition</strong></td>
<td>Available controller: Fader controller, AUTO or CUT button / Type: MIX or WIPE (DVE included)</td>
<td>—</td>
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<tr>
<td><strong>Switcher Store</strong></td>
<td>2 channels (with backup feature). Each channel can hold up to 227 frames of HD video</td>
<td>—</td>
</tr>
<tr>
<td><strong>Keyer/DSK</strong></td>
<td>4 channels (KEYEY x 2 + DSK x 2), includes 2D DVE that can be freely assigned</td>
<td>—</td>
</tr>
<tr>
<td><strong>Multi-viewer</strong></td>
<td>An advanced, high quality Chroma keyer can be assigned to any one of the two keyers or two DSKs.</td>
<td>—</td>
</tr>
<tr>
<td><strong>Proc. Amp.</strong></td>
<td>Equipped with all inputs</td>
<td>—</td>
</tr>
<tr>
<td><strong>Event Memory</strong></td>
<td>100 events (complementary transition available when loading events)</td>
<td>—</td>
</tr>
<tr>
<td><strong>Macro Function</strong></td>
<td>30 commands (up to 230 series of operations can be registered per command)</td>
<td>—</td>
</tr>
<tr>
<td><strong>Genlock Input</strong></td>
<td>BB: NTSC: 0.429 Vp-p/PAL: 0.45 Vp-p or Tri-level Sync: 0.6 Vp-p, 750i, BNC x 1, loop-through (to be terminated with 75Ω terminator, if unused)</td>
<td>—</td>
</tr>
<tr>
<td><strong>System Phase Adjust</strong></td>
<td>Horizontal: 1H to +1H</td>
<td>—</td>
</tr>
<tr>
<td><strong>Genlock Output</strong></td>
<td>BB: NTSC: 0.429 Vp-p/PAL: 0.45 Vp-p or Tri-level Sync: 0.6 Vp-p, 750i, BNC x 1</td>
<td>—</td>
</tr>
<tr>
<td><strong>I/O Delay</strong></td>
<td>1H (minimum delay)</td>
<td>—</td>
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<tr>
<td></td>
<td>0 to 1 frames +1H (when FS or re-size engine used)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>1 to 2 frames +1H (when FS or re-size engine plus DVE used)</td>
<td>—</td>
</tr>
<tr>
<td><strong>External Memory</strong></td>
<td>USB flash drive</td>
<td>—</td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td>Ethernet (100/1000Base-TX): RJ-45 x 1</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>TO-IN: RJ-45 x 1</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>GPI-IN/OUT: 5-pin D-sub female x 1 (2 inputs/2 outputs), TTL negative logic pulse or Make-contact</td>
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<tr>
<td></td>
<td>FS-422: 9 pin D-sub female x 2 (for the HVS-30RU and tally unit connection or EDITOR port [B/S-3000 and WS-100 protocols])</td>
<td>—</td>
</tr>
<tr>
<td><strong>Interface (optional)</strong></td>
<td>ANPNET: 75Ω, BNC x 2, loop-through (to be terminated with 75Ω terminator, if unused) for control panel and AUX remote panel connection</td>
<td>—</td>
</tr>
<tr>
<td><strong>Temperature / Humidity</strong></td>
<td>0°C to 35°C / 10% to 90% (no condensation)</td>
<td>—</td>
</tr>
<tr>
<td><strong>Power / Consumption</strong></td>
<td>HVS-100: 100 V AC to 240 V AC ±10%, 50/60 Hz / Approx. 120 W (full option: 200 W) HVS-100OU: 100 V AC to 240 V AC ±10%, 50/60 Hz / Approx. 14 W</td>
<td>100 V AC to 240 V AC ±10%, 50/60 Hz / Approx. 120 W</td>
</tr>
<tr>
<td><strong>Dimensions / Weight</strong></td>
<td>HVS-100: Approx. 430 (W) x 88 (H) x 255 (D) mm / Approx. 5 kg (incl. optional cards: Approx. 7 kg at most) HVS-100OU: Approx. 420 (W) x 87.2 (H) x 246.5 (D) mm / Approx. 2.6 kg</td>
<td>Approx. 420 (W) x 120.3 (H) x 246 (D) mm / Approx. 4 kg</td>
</tr>
<tr>
<td><strong>Consumables</strong></td>
<td>Power supply unit (to be replaced every 5 years), Cooling fan (to be replaced every 4 years)</td>
<td>—</td>
</tr>
<tr>
<td><strong>Accessories</strong></td>
<td>CD-ROM (user’s manual), Quick setup guide, Rack mount brackets for main unit, AC cord, Main unit and control panel connecting cable (10 m)</td>
<td>—</td>
</tr>
<tr>
<td><strong>Options</strong></td>
<td>For details, see “Options” in the body text</td>
<td>—</td>
</tr>
</tbody>
</table>